CLAIMS

I claim:

1. An oscillator comprising:

a direct digital synthesizer (DDS) that provides a controlled frequency output,

a phase-locked-loop (PLL), operably coupled to the DDS, that is configured to provide a tracked frequency output based on the controlled frequency output and a first scale factor,

a scaling synthesizer, operably coupled to the PLL, that is configured to provide an oscillator output based on the tracked frequency output and a second scale factor.

2. The oscillator of claim 1, wherein

the PLL includes a voltage controlled crystal oscillator (VCXO).

3. The oscillator of claim 1, wherein

the scaling synthesizer includes an other phase-locked-loop.

4. The oscillator of claim 1, wherein

the controlled frequency output is within a predetermined frequency band, and

the frequency band is determined based on the characteristics of the DDS to minimize unwanted phase modulation.

5. The oscillator of claim 1, wherein

the PLL is configured to operate with predetermined loop filter characteristics, and

the loop filter characteristics are determined to provide a desired step-response-time at the oscillator output.

6. The oscillator of claim 1, wherein

the DDS includes a numerically controlled oscillator (NCO) that provides the controlled frequency output based on an accumulation of a phase increment factor.

7. The oscillator of claim 6, further including

a low pass filter that is configured to receive the controlled frequency output from the DDS, and to provide therefrom a filtered controlled frequency output to the PLL.

8. A method of providing an oscillation signal, comprising:

generating a first signal at a controlled frequency,

providing a second signal at a frequency that is phase-locked to the first signal,

scaling the frequency of the second signal to produce the oscillation signal.

9. The method of claim 8, wherein

generating the first signal includes a direct digital synthesis of the first signal.

10. The method of claim 9, wherein

scaling the frequency includes phase-locking the oscillation signal to the second signal.

11. A system comprising:

an oscillator that is configured to provide an oscillation signal based on one or more control parameters, and

a controller, operably coupled to the oscillator, that is configured to provide the one or more control parameters, wherein

the oscillator includes:

a direct digital synthesizer (DDS) that provides a controlled frequency output based on the one or more control parameters,

a phase-locked-loop (PLL), operably coupled to the DDS, that is configured to provide a tracked frequency output based on the controlled frequency output and a first scale factor,

a scaling synthesizer, operably coupled to the PLL, that is configured to provide the oscillation signal based on the tracked frequency output and a second scale factor.

12. The system of claim 11, wherein

the PLL includes a voltage controlled crystal oscillator (VCXO).

13. The system of claim 11, wherein

the scaling synthesizer includes an other phase-locked-loop.

14. The system of claim 11, further including

a mixer, operably coupled to the oscillator, that is configured to combine an input signal and the oscillation signal to produce an output signal.

15. The system of claim 14, wherein

the system corresponds to a communications receiver and

the mixer includes a demodulator.

16. The system of claim 15, wherein

the one or more control parameters are provided by the controller based on a velocity of a transmitter of the input signal relative to the communications receiver.

17. The system of claim 11, wherein

the system corresponds to a communications transmitter.

18. The system of claim 17, wherein

the one or more control parameters are provided by the controller based on a velocity of a receiver of the input signal relative to the communications transmitter.

19. The system of claim 11, wherein

the controller is configured to provide the one or more control parameters based on values of an input modulation signal.

20. The system of claim 11, wherein

the controlled frequency output is within a predetermined frequency band, and

the frequency band is determined based on the characteristics of the DDS to minimize unwanted phase modulation.

21. The system of claim 11, wherein

the PLL is configured to operate with predetermined loop filter characteristics, and

the loop filter characteristics are determined to provide a desired step-response-time at the oscillator output.

22. The system of claim 11, wherein

the DDS includes a numerically controlled oscillator (NCO) that provides the controlled frequency output based on an accumulation of a phase increment factor.

23. The system of claim 14, wherein

the oscillation signal has a frequency of at least 1 gigaHertz, and

the frequency of the oscillation signal is controllable with a resolution of less than ten Hertz via a control of the controlled frequency output.

24. The system of claim 23, wherein

a range of the controlled frequency output is in an order of kiloHertz, and

a range of the oscillation signal is in an order of hundreds of kiloHertz.